

Stress analysis for thick rectangular plates

Mohammed A.K., Baluch M.H., Azad A.K.

Transactions of the Canadian Society for Mechanical Engineering
Vol. 14, Issue.3, 1990

Abstract: The governing equations, previously developed for plate bending and inplane stretching [1], are solved for the average displacements, w_{avg} , u_{avg} , v_{avg} , and average rotations ϕ_x , ϕ_y . This involved the solution of the governing equations for the inplane problem, which has not been accomplished in previous refined theories. Explicit expressions for inplane stresses σ_x , σ_y , and τ_{xy} were found. The coupling of the bending problem and the inplane problem is manifested through the expressions derived from the inplane stresses. Also expressions for the resultant shear forces Q_x , Q_y ; resultant couples M_x , M_y , M_{xy} ; and resultant inplane forces N_x , N_y , and N_{xy} are found. III-conditioning problems that appear in a previous companion refined theory [2] were overcome in this present work. Results are compared with those as obtained from other refined theories.